There's a deeply rooted necessity to turn disaster into opportunity.
Lawrence Vale, MIT Department of Urban Studies and Planning
Newsweek article on the rebuilding of New Orleans, 12 September 2005

HEALTH DISPARITIES

Crisis Not Over for Hurricane Victims

Thousands of Gulf Coast families displaced in 2005 by Hurricanes Katrina and Rita are the victims of an unprecedented epidemic of chronic medical and mental health problems, yet are receiving little appropriate care, reveals a report released 17 April 2006 from the Mailman School of Public Health. "A year after Katrina, over half of the New Orleans population has not returned—perhaps as many as three hundred thousand people," says principal investigator David Abramson, acting director of research at the Columbia University National Center for Disaster Preparedness. Many families still live in FEMA-subsidized trailer parks.

Even before the hurricanes hit, Louisiana and Mississippi ranked 50th and 49th in the nation, respectively, in terms of overall health status, according to the United Health Foundation's *America's Health: State Health Rankings 2004*. Today, post-hurricane reconstruction has hardly begun. With the loss of hospitals, clinics, pharmacies, medical records, and (for many people) employer-subsidized medical insurance, thousands of residents of what was already one of the nation's most medically underserved regions could be facing serious long-term health consequences.

Under the auspices of the Louisiana Child & Family Health Study, Abramson's team used multistage random sampling to select 820 households from 14 FEMA-financed housing sites across Louisiana. More than three-quarters of the households responded, representing 1,171 adults and 488 children. Respondents were interviewed at their homes about chronic medical conditions suffered by their family members, their children's emotional and behavioral status, their previous and current access to health care services, medical insurance coverage, and the family's post-hurricane displacement history.

Respondents had moved an average of 3.5 times—some as many as 9 times—with the consequent loss of stability. Thirty-four percent of the children had at least one diagnosed chronic medical condition, a rate one-third higher than the general U.S. child population, with asthma and developmental delays among the most-cited problems. Nearly half the children who had a personal doctor before the hurricanes no longer had one.

Almost 50% of the parents said at least one of their children had emotional or behavioral problems they did not have before they became displaced. And the children aren't alone: a standardized test given at the time of the interview indicated that more than two-thirds of the mothers interviewed may be suffering depression or anxiety disorders.

Greg Henshall/FEMA

Adding insult to injury. Children play in the Baker, Louisiana, FEMA trailer park where they have been living since Hurricane Katrina forced them from their New Orleans homes. A new study shows that many children displaced by the hurricane have lost what small access to health care they had to start with, and therefore are not being treated for a host of medical conditions.

Though these families are in acute need of medical surveillance, access to health care resources remains limited. According to a white paper accompanying the report by the Children's Health Fund, which lobbies for comprehensive health care for all children, only 3 of 9 acute care hospitals that existed in New Orleans before Katrina are now operating at full capacity, and only 19 of 160 clinics remain open. Some 44% of respondents had no medical insurance—about twice as many as before Katrina. In addition, people who were earning above the threshold for receiving Medicaid before Katrina hit were still ineligible for that program since eligibility depends on the previous year's income.

The white paper calls for Congress and President Bush to establish a "health care Marshall Plan" to address the urgent needs of displaced families. "National leaders need to be aware that this is an unprecedented situation," says Irwin Redlener, director of the National Center for Disaster Preparedness and president of the Children's Health Fund. "There needs to be an emergency effort to bring health care professionals to the Gulf region, to rebuild hospitals, to get people's medical conditions into databases that can be used wherever they end up, to increase mental health benefits under Medicaid, and to bring school-based health services fully online."

Senator Susan Collins (R–Maine), chairwoman of the Senate committee that investigated the government response to the Katrina disaster, says, "Nearly a year after Hurricane Katrina, Gulf Coast residents are still struggling to return to a sense of normalcy. It is extremely important that the government do all that it can to help address not just this immediate health crisis but all of the long-term needs of those who survived this terrible natural disaster."

Adds Senator Mike Enzi (R–Wyoming), "We must build on the private and public sector investments in New Orleans and the Gulf Coast, attracting medical personnel as hospitals and health centers are rebuilt, and give survivors the necessary and appropriate assistance to reclaim their lives."

The authors plan to publish the full text of *On the Edge: Children and Families Displaced by Hurricanes Katrina and Rita Face a Looming Medical and Mental Health Crisis* in a peer-reviewed journal. In the meantime, the report is available free of charge by contacting Abramson at dma3@columbia.edu. **–Adrian Burton**

Occupational Health

An Ugly Picture for Flower Workers and Their Children

Every year, Americans spend nearly $20 billion on fresh flowers, about 70% of which come from abroad, mainly from Latin America, according to the Society of American Florists. While this can represent an economic boon for some countries, overuse of pesticides and lack of protections for female workers can cause serious health effects for those women's children, according to a paper in the March 2006 issue of *Pediatrics*.

Nipping hazards in the bud. Use of protective equipment while pregnant can curb ill effects in the children of floriculture workers.

The study of female workers in Ecuador's flower industry and their children found that a mother's work exposure to pesticides during pregnancy was associated with neurological impairment, including a significant decrease in visuospatial performance. After accounting for other factors such as malnutrition, the researchers concluded that "prenatal pesticide exposure may adversely affect brain development."

The authors, led by Philippe Grandjean, an adjunct professor at the Harvard School of Public Health, also found that children whose mothers were exposed during pregnancy tended to have higher blood pressure than unexposed children, a finding with broader implications. "Increased blood pressure, when present in childhood, is a risk factor for cardiovascular disease in later life," the researchers noted.

The researchers looked at schoolchildren under the age of 10 in the Andean community of Tabacundo. Physical exams checked each child's blood pressure and certain neurobehavioral functions, such as motor coordination, dexterity, attention, short-term memory, balance, and spatial perception and performance. Mothers were interviewed about their own exposure history and background as well as their children's medical history and health. The data analysis took into account each family's housing and nutritional situation, as well as maternal education. The researchers also measured current pesticide exposure among the children.

Of 72 children included in the analysis, 37 were considered to have been exposed prenatally—they were born to women who had worked in the floriculture industry while pregnant. All of these mothers reported following normal safety precautions, and none had worked as pesticide applicators. Nineteen of the exposed children's fathers and 16 of the unexposed children's fathers also had worked in floriculture during the pregnancy, while most other fathers worked in construction trades.

Prenatal exposure was associated with significantly higher systolic blood pressure and substantial deficits on spatial performance. In this regard, the researchers concluded that pesticide toxicity may add to the adverse influence of malnutrition. Also, the effects of prenatal pesticide exposure seemed to last longer than those known to be associated with pesticide exposures in adults. However, the investigators found no link between prenatal exposure and stunting.

Elizabeth Guillette, an anthropologist at the University of Florida who has studied the health effects of pesticides in Mexico, says Grandjean's study reinforces earlier findings. "Pesticide use is definitely impacting the offspring in terms of mental and neurophysical abilities," she says.

Such concerns motivated the founders of Organic Bouquet, which since January 2001 has marketed flowers produced with fewer toxic pesticides. It sells flowers online and in natural food stores such as Whole Foods, using only producers certified by one of three programs. VeriFlora, one of the three certification programs, sets criteria for U.S.-sold flowers that include low pesticide residue and compliance with local labor laws.

As for traditional flower farms, Guillette says much better education is needed—not just on safe use at work, but also safe practices in the home, such as washing exposed clothes separately and minimizing in-home pesticide use. Grandjean agrees that education would help, but only if industry and individuals follow through with less extensive fumigations at work, use of less-toxic chemicals at work and at home, and use of protective equipment.

"I'm optimistic we can do something and change," says Guillette, "but action needs to be taken now." **–David A. Taylor**

Top to bottom: Photodisc; Philippe Grandjean/Harvard School of Public Health; Chris Reuther/EHP

Tax Schemes for Environmental Payoff

A new policy brief from the World Resources Institute and the Brookings Institution examines how different fiscal strategies can both raise money and benefit the environment. The brief discusses state-level initiatives that tax septic systems and gasoline consumption as well as the federal law signed in 1989 that taxes certain ozone-depleting chemicals. This law brought about the 38% reduction in use of those chemicals in the year 1990 and raised almost $3 billion in its first five years. The brief also points out tax schemes that have had unintended adverse environmental effects. The authors propose water pollution, nitrogen fertilizer, and carbon as viable options for taxation. The brief is available online at http://pdf.wri.org/greening_the_tax_code.pdf.

WTO Kills European GMO Moratorium

In May 2006, the World Trade Organization ruled that the European Union moratorium on genetically modified (GM) foods was illegal. The case was brought by the United States, Canada, and Argentina, the world's biggest producers of GM foods. The ruling also came down against six individual European member states that had their own bans on certain GM products, stating they had provided no scientific evidence to justify their moves. The case did not address the safety of GM foods or whether they can be compared to conventional products. The ruling can be appealed by both parties.

Ironic Breeze

Researchers at the University of California, Irvine, confirm in the May 2006 issue of the *Journal of the Air & Waste Management Association* that indoor air purifiers used in small, poorly ventilated areas can add to indoor ozone levels, creating concentrations that exceed regulatory standards. In the study, ozone levels reached levels higher than 350 ppb, which would trigger a Stage 2 smog alert if it occurred outdoors. Ozone can cause lung damage and aggravate chronic lung diseases such as asthma. No agency has the authority to govern the amount of ozone that air purifiers can produce. However, the U.S. EPA and the California Air Resources Board have issued advisories discouraging the use of these machines.

CHEMICAL EXPOSURES

PFOA Alters Liver Gene Expression

In the latest of a series of strikes against perfluorooctanoic acid (PFOA), the chemical has been found to affect gene expression in the livers of lab rats. PFOA is used in the manufacturing of fluorotelomers, which include nonstick substances such as DuPont's Teflon®. PFOA is released when these fluorotelomers break down in the environment or the body. PFOA is stable in the environment, has been found in wildlife thousands of miles from an identifiable source, and bioaccumulates.

PFOA has been implicated in increasing in "bad" LDL cholesterol, while leaving "good" HDL cholesterol unaffected. Other studies have linked PFOA exposure to increased risk of stroke. PFOA is being phased out of use in the United States under a January 2006 agreement. DuPont will eliminate its PFOA use by 2015, and 3M has already phased it out of its Scotchgard™ line entirely. However, use of PFOA is increasing in Asia with the growth in industry there, especially in the Pearl River Delta of Southern China.

In the study, published in the January 2006 issue of *Toxicological Sciences*, Keerthi S. Guruge and colleagues exposed five groups of seven-week-old rats to daily doses of PFOA ranging from 1 to 15 mg/kg body weight. A control group received no PFOA. When the rats' livers were tested the scientists found that the expression of more than 500 genes changed significantly at at least one dose level, and 144 were affected at all dose levels. The total number of genes affected peaked at the 10-mg/kg dose.

The largest category of genes affected were those that control how the liver transports and metabolizes lipids, especially fatty acids, says coauthor Paul K.S. Lam, a professor of biology at the City University of Hong Kong. Lam and Guruge—a senior scientist at Japan's National Institute of Animal Health in Tsukuba—emphasize that these studies were conducted with hyperdoses of 100 to 1,000 times what might be found in environmental exposure.

Nonetheless, this work could be an important step toward explaining the increases in LDL seen with PFOA exposure, says Tim Kropp, a senior scientist for the nonprofit Environmental Working Group. "It starts to give you a clearer picture of what may be going on," Kropp says. He adds that more animal studies are needed to put this work in context.

A related chemical, perfluorooctane sulfonate (PFOS), has been studied more extensively than PFOA, Lam says, but it's important to look at the possible culprit itself. "There is a temptation for people to use existing data on PFOS for PFOA because there are some similarities in terms of the structure," he says. "[But] no matter how similar they are, they are different."

The team is now starting to look at how PFOA affects the kidneys, and they have expanded to the avian world with a chicken study to look for similar genetic effects. "If [the models] behave similarly," Guruge says, "that means they must have some kind of common biomarkers." **–Scott Fields**

PHARMACEUTICALS

An Outbreak of New Sources of Avian Flu Drug

Worldwide, 228 people have been infected with H5N1 avian influenza, largely through exposure to sick birds; of these, more than half have died. Although only limited human-to-human transmission has been confirmed, scientists fear a worldwide pandemic could erupt if the virus mutates to a highly pathogenic form that humans can efficiently pass among themselve. Now scientists are finding faster, cheaper ways to produce more of the only drug proven capable of combating avian flu.

Tamiflu (oseltamivir phosphate) reduces flu mortality by inhibiting the virus from spreading among cells. For several years Roche Pharmaceuticals has made the drug with shikimic acid from the pod of the star anise tree, a native of Asia. Extracting the acid is slow and expensive, but productive enough to meet the demand for regular seasonal flu. Recent "shortages" occurred when countries started stockpiling the drug in anticipation of a potential pandemic.

In the 17 May 2006 *Journal of the American Chemical Society*, two separate teams describe new methods for synthesizing oseltamivir phosphate without using shikimic acid. "We came up with a very efficient route," says Harvard University chemist Elias Corey of his petrochemical-based method. "The yield is twice as much as with the present process." In the other new method, Masakatsu Shibasaki and colleagues at the University of Tokyo use 1,4-cyclohexadiene, a benzene derivative, as a catalyst.

Sweetgum surprise. Researchers are finding new sources of shikimic acid.

Chris Reuther/EHP

Other researchers are taking another tack: finding new sources of shikimic acid. Chemistry professor Thomas Poon of Claremont McKenna College has extracted the acid from the seeds of sweetgum trees, while Canada-based Biolyse Pharma found a source in the needles of discarded pine, fir, and spruce Christmas trees. Neither of these methods has been published.

Roche has significantly expanded its Tamiflu production capacity over the past several years, and will be able to produce up to 400 million treatment courses annually by the end of 2006—a more than 10-fold increase over 2004 capacity. Production is getting a boost in part as Roche replaces most of the star anise extraction with *Escherichia coli* fermentation. The bacteria produce shikimic acid quickly and cheaply from glucose. Roche and its partners plan to substantially increase their fermentation capacities over the coming years.

Roche spokesman Terence Hurley wouldn't say whether the company anticipates adopting any other new methods. He did point out that a new process would require approval of the FDA and its foreign counterparts.

If Roche doesn't use his technique, Corey hopes another manufacturer does. This could happen despite Roche's patent rights—if it ever does come down to a human pandemic, the 2001 Doha Declaration of the World Trade Organization states that countries facing a public health crisis may grant licenses for production of patented drugs. **–Cynthia Washam**

ehpnet

UNEP Finance Initiative

Around the time of the Rio Earth Summit, the UN Environment Programme began raising awareness of environmental and sustainability issues among the financial industry. Today, the program's Finance Initiative (UNEP FI) helps more than 160 firms—including some of the world's largest banks, insurers, and fund managers—to integrate sound environmental and sustainability practices into their operations. The UNEP FI website, located at http://www.unepfi.org/, provides an in-depth look at the organization's activities.

Signatories commit to upholding the principles outlined in one of the two UNEP FI statements of principles (one is specifically for financial institutions, the other for insurers). These voluntary, nonbinding statements reflect the belief that sustainability is not just a responsibility but also a sound business practice. Each signatory pays an annual fee, attends UNEP FI General Meetings, and submits a brief annual report on steps the institution has taken that year to advance its commitment to the relevant UNEP FI statement. Signatories may also participate in training and workshops, task force meetings, global roundtables, and themed conferences sponsored by the initiative. The Our Signatories section of the website lists the UNEP FI signatories and includes the text of the two UNEP FI statements of principles.

The UNEP FI sponsors regional activities, work groups that focus on finding creative ways to link finance and sustainability, training programs, and research. The Work Programme section of the website describes the core activities that the UNEP FI focuses on. The Climate Change Working Group examines carbon finance (which includes the use of tradeable "carbon credits"), policy and regulation debates, and renewable energy. The UNEP FI is also conducting four projects related to finding ways to link social, environmental, and governance issues with responsible investment practices. A third core activity is sustainability management and reporting, the development of environment and social performance indicators specially tailored to the finance industry. The UNEP FI is also exploring ways to invest responsibly in politically risky nations, and to leverage water-related issues to the benefit of both resource sustainability and business.

The Regional Activities section details the work of task forces that the UNEP FI has established in the African, Asian/Pacific, Central/Eastern European, Latin American, and North American regions. These task forces are responsible for overseeing UNEP FI activities of local signatories and for facilitating relationships among signatories that allow them to interact and share information.

Visitors to the site can also sign up to receive the UNEP FI e-bulletin, which contains a rundown of news, events, and new publications. Back issues of the e-bulletin are available, as are all issues of the quarterly UNEP FI newsletter, *0.618...* (the name refers to the golden ratio and reflects the ratio of risk to reward inherent in sustainable development). This newsletter features articles written by experts in the field. **–Erin E. Dooley**

Sunscreen Ads Miss Men

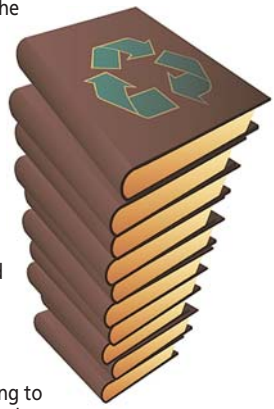
A Boston University review of 24 popular magazines found that publications aimed at groups at high risk for skin cancer rarely contain advertising for sun protection products. Middle-aged and older men are both the least likely to use sunscreen and the most likely to die from melanoma, the deadliest form of skin cancer. But of almost 800 sun-care product ads that appeared in six years' worth of the 24 magazines, three-quarters were found in women's magazines. The researchers noted that women's magazines ran an average of four sun-care product ads per issue, while parenting and family magazines carried less than one per issue, and outdoor recreation magazines aimed at men ran ads just once every six issues.

Wal-Mart Aims for Organic

The summer of 2006 will see the food shelves of the world's largest retail chain, Wal-Mart, getting an organic boost. The company will begin selling a wide range of organic foods at relatively affordable prices—possibly just 10% higher than conventional food. Wal-Mart, already the biggest seller of organic milk, is now pressing its suppliers for organic versions of well-known brand-name products. Critics worry that the move will force more industrialization of organic farming in ways that may not be true to traditional organic principles—for example, by forgoing the field rotation used by small farms. Further, because supply for organic goods already lags behind demand, Wal-Mart may have to turn to suppliers overseas, which will cause more transportation-related pollution.

Random Acts of Sustainability

Random House, a publisher with 13% of the U.S. adult book trade, announced in May 2006 that it plans to raise the amount of recycled paper it uses to print books from 3% to 30% by the year 2010. Random House is the first major U.S. publisher to commit to such a change. By 2008, the company also aims to use at least 10% recycled materials for glossy items such as art and cookbooks. More than 500,000 trees could be saved yearly thanks to the switch. Luckily for book buyers, the cost for switching to recycled paper should be in the range of cents, not dollars.



Top to bottom: Image Source; UNEP FI; Dan Jones/iStockPhoto, Chris Reuther/EHP